



Flood Control District of Maricopa County

Drainage Guidelines for Single-Lot Development

April 18, 2003

Revised July 14, 2003

These drainage guidelines are established to help property owners minimize adverse impacts to land areas characterized by the following:

**Significant slopes,
Erodible soils,
Desert vegetation, and
Shallow braided channels and/or sheet flow,**

which can lead to surface and channel instability.

The drainage guidelines presented herein are in addition to the Drainage Regulations and the Floodplain Regulations.

I. Applicable Regulations

A. Drainage Regulations for Maricopa County, September 26, 1988, 1994 Revision

1. Authority

Article IV, Administration, Section 403, Discretionary Powers: *“The Drainage Administrator may adopt drainage design standards, guidelines, administrative rules, procedures and policies to implement and effectuate the purposes of this Regulation.”*

Article XI, Area Drainage Master Study, Section 1101, Adoption: *“Whenever an Area Drainage Master Study authorized under this regulation has been completed, such plan including uniform rules for development may be submitted to the Board of Supervisors for adoption as an Area Drainage Master Plan. If adopted by the Board of Supervisors, the District shall enforce the Area Drainage Master Plan under this regulation.”*

B. Floodplain Regulations for Maricopa County, August 4, 1986, 2000 Revision

Washes in designated floodplains are governed by the Floodplain Regulations.

I. Single-lot Development in the Rio Verde Area

A Drainage Clearance is required from the Flood Control District of Maricopa County for all single-lot development including **all structures, walls, fences, and site grading** within unincorporated Maricopa County per Sections 601 and 604 of the *Drainage Regulations*.

A. Purpose

The purpose of these *Drainage Guidelines for Single-lot Development* is to promote and protect the health, peace, safety, comfort, convenience and general welfare of the citizens of Rio Verde by regulating drainage to limit the adverse cumulative impacts of single-lot development within the Rio Verde area and to minimize unnecessary loss from erosion and flooding.

The existing landforms within the Rio Verde and other areas generally consist of small, shallow, braided washes with overland sheet flow that is easily influenced by changes in vegetation coverage and surface grading. Such changes could result in concentration of flows that could dramatically increase rates of erosion, modify channel flow paths, and cause damage to downstream and adjacent properties. The strategy employed in these guidelines is to minimize disturbance of existing natural washes, native vegetation, and landform to protect the processes and interactions that currently exist between storm water runoff and sediment transport.

B. Applicability

The requirements set forth in these *Drainage Guidelines for Single-lot Development* are in addition to existing requirements contained in the Drainage Regulations and the Floodplain Regulations. These guidelines shall in no way be construed to relieve the developer of any development requirements already in existence. These guidelines should be applied to all new construction on single-lots within the unincorporated areas of the Rio Verde or similar watersheds. **Improvements that have already been permitted as of May 2003, or were completed before permits were required may not follow the guidelines, because the guidelines were not available. However, if new improvements are proposed for a lot with existing improvements, new retention, perimeter wall modifications, or other measures may be needed to minimize the impact of potential flooding or erosion on this lot or adjacent lots.**

C. Drainage Guidelines for Single-lot Development

1. Engineered Plans have been and will continue to be required for most development in the area.

2. Existing washes

The site plan should identify any existing natural washes, drainage tracts, easements, or drainage channels located on the lot, or bordering the lot, that may involve or affect the drainage of the lot to be developed. The intent of these guidelines is to minimize the impacts to the numerous washes that flow throughout the area. These washes are vital to the balance of soil erosion and sediment deposition that occurs.

Wash Definition: Existing natural washes to be managed by these guidelines include major washes and secondary washes and are defined as follows:

- a) Major Wash - An existing natural wash that has a discernable sandy bottom width of five (5) feet or greater or as determined by the Drainage Administrator.
- b) Secondary Wash - An existing natural wash that has a discernable sandy bottom width less than five (5) feet or as determined by the Drainage Administrator.

Major washes should not be disturbed, which includes grading, grubbing or relocating. An at grade driveway crossing may be permitted if no other access is available.

Any disturbance of secondary washes is discouraged. There may be instances where the only option for constructing a house on a lot is to relocate a secondary wash. In these cases the new channel design must be designed by an engineer and must maintain the original wash bottom elevation; the

original width/depth ratio or at least the original cross-sectional area in order to avoid excessive erosion and deposition due to changes in channel character. Erosion protection for the disturbed wash will be required.

Wash Setback Requirement: The distance a structure must be setback from a wash is defined as a “setback distance”. The setback distance for both major washes and secondary washes should follow State Standard 5-96, Guideline 1, *Lateral Migration Setback Allowance for Riverine Floodplains in Arizona*, except that the minimum setback is reduced to fifteen (15) feet. A structure may be set closer to a wash, if the foundation footing is set lower than the wash invert scour potential and/or erosion protection for the structure is provided.

3. Disturbance of Area

Grading of lots should be limited to the minimum area required to develop the site, up to a maximum of 40 percent of the total lot area. Removing vegetation and disturbing the soil increases the amount of runoff (water) leaving the site as well as increasing water velocity and erosion potential of the property. All new lots resulting from a lot split will be required to meet these disturbance area limitations following the lot split.

The site plan must outline the areas to be disturbed, which includes any kind of grading, grubbing, or vehicle traffic. The percentage of disturbed area should be stated on the site plan. If an area of disturbance greater than 40 percent is required, then retention will be needed to minimize the increase in flow that is generated from the removal of vegetation and disturbance of the soil. The engineered plans and report should show that the increased amount of disturbed area will not increase erosion or deposition on downstream or adjacent property owners.

Improvements that have already been permitted as of May 2003, or were completed before permits were required may not follow the guidelines, because the guidelines were not available. However, if additional improvements are proposed for a lot with existing improvements, that increases the area of disturbance to greater than 40 percent then the criteria mentioned above should be followed and retention provided.

4. Retention Requirement

Retention should be provided if the disturbed areas exceed the percentage allowed in Section II.C.3 above. Basin(s) should be constructed to retain the first 0.65 inches (0.054 ft) of runoff from the entire disturbed area. The runoff from disturbed areas should be directed to the retention basin(s), and be sized according to the contributing area.

$$\text{Volume of Basin(cf)} = 0.054(\text{ft}) \times (\text{Total Disturbed Area (sf)})$$

The retention area must be shown on the site plan and be preserved and maintained by the property owner in perpetuity.

5. Walls and fences

Solid walls, wrought iron, or mesh fences should not be used as a perimeter fence due to the sheet flow characteristics of runoff in this area unless specifically approved by the Drainage Administrator. Acceptable perimeter fence types include pipe rail, split rail, barbed wire, or other open fencing. Mesh fencing on the bottom of open fencing should not be used.

Closed fencing (solid walls or mesh fencing) may be used around pools and as ‘courtyard’ type enclosures, which are located on the down slope side of the house, protected from sheet flow by the house. ‘Courtyard’ type fencing may need to have drainage openings to allow water to pass through the yard or to drain the yard.

6. Finished Floor Elevations

For lots **not** located in a District regulated floodplain, building finished floors will be elevated a minimum of 1.5 feet above the highest adjacent natural grade or two (2) feet above the 100-year water surface elevation of a major wash located on the property, whichever is greater.

For lots located in a District regulated floodplain, the floodplain regulations apply for the building’s finished floor.

Finished floors may be stepped down to form a multi-level structure to reduce down slope fill heights as long as all points along the foundation meet the elevation requirement. Stepping down of finished floors is only allowed in the down slope direction. The perimeter of the building pad should be graded to direct surface runoff around the building and to disperse the flow back to a sheet flow condition down slope from the structure. Erosion protection may be required around the building pad.

For lots located **within** a District regulated floodplain, the finished floor elevation will be set according to the floodplain regulations.

7. Driveways

Driveways are to be included as part of the disturbance area. Driveways crossing major and secondary washes will be limited to the minimum number of crossings required to access the lot and outbuildings, will be the minimum width necessary for the intended use, and will minimize changes to the channel cross-section. The preferred crossing type is an at grade dip crossing. Culvert crossings, when required, will be designed to minimize changes to the sediment transport continuity of the reaches upstream and downstream of the culvert and will require erosion protection. A registered civil engineer must design proposed culvert crossings.